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"VERONICA" IN NORTH AND SOUTH AMERICA.

FRANCIS W. PENNELL

THIS study is the outgrowth of several attempts to revise our knowledge of the species of "Veronica" growing in different portions of the Western Hemisphere. Whether in our own "Local Flora," in the Rocky Mountain or the Southeastern States, or in Colombia and Ecuador, certain wide-ranging species were encountered, and the effort to verify the nomenclature in many instances took the reviewer into problems of the identity of Old World allies. On these accounts it has seemed best to consider in one study the plants of this group in both North and South America, and also to include known naturalized species.

Of all the tribes of the Scrophulariaceae mentioned by von Wettstein in his great revision of the family in "Die Natürlichen Pflanzenfamilien," that of the Digitaleae, to which *Veronica* is assigned, probably has least coherence. The plants at least should agree in having the antero-lateral lobes of the corolla external in aestivation and in not being parasites. I know of no offenders against the latter criterion. But, because they possess not only posterior corolla-lobes external but also form characteristic glands on the fruit or in the leaves, I have recently transferred the two lowland Tropical genera *Capraria* and *Scoparia* to the essentially Tropical tribe Gratioleae. This restricts the Digitaleae to a more likely distribution through the Temperate or Arctic zones and the cooler zones of Tropical mountains. I can not further analyze the tribe here, except to say that *Digitalis* itself, through possessing styles distinct at apex and a

septicidally dehiscent capsule, has seemed so remote from the plants which we are now considering that I have preferred to call these Veroniceae.

By a close comparison of species and genera, laying emphasis upon those characteristics which occur in correlation, the taxonomist can go far toward giving us a dynamic view of the races of life on the earth today. In this paper I shall try to group the species in accord with what I believe has been a real evolutionary advance, but it must be realized that few groups hold only old features unmodified, while few contain wholly new ones, although fortunately new characters do tend to appear in correlation. A growing knowledge of what are generalized structures in the Scrophulariaceae makes me believe this reconstruction safe. Fuller discussion of the phylogeny of this family is reserved for a later paper.

Within the small limits of "Veronica," as may be seen from the keys below, we have certain more or less fundamental changes. A septicidal dehiscence of the capsule, splitting along the line of carpel-union, is certainly primitive for the family. As might be expected in a group so highly modified as "Veronica" (its complexity is shown by the union of the posterior corolla-lobes, reduction of stamens to two, the united stigmas, etc.), we fail to find this method of capsule-dehiscence, but we do find two types which seem to have been derived independently from it. In the New Zealand and Patagonian plants which were originally described as *Hebe*, the carpels part, thus splitting sagittally the septum, after which a distal median suture through the septal wall of each carpel permits the seeds to escape. These plants are shrubs or even trees, and bear their flowers in specialized axillary racemes, a feature the significance of which will soon be discussed. Moreover *Hebe* has an exceedingly baffling tendency to form local races, a habit at contrast with that of the other "Veronicas." The austral distribution, with its suggestion of genetic remoteness, emphasizes *Hebe's* claim to recognition as a genus.

In the other genera septicidal dehiscence has been lost, or persists but as a tardy secondary rupture of the outer capsule-wall and one which never parts the septum. It is most pronounced in the relatively primitive genus *Veronicastrum*, called until recently *Leptandra*. Here, as is normal in Scrophulariaceae and is the case in *Hebe*, the capsule is longer than wide, and is turgid. The original seed of the

family (as seen in most Gratioleae and Buchnereae) was certainly covered with a simple reticulate testa, but among the “Veronicas” this stage survives only in *Veronicastrum* and the European *Paederota*, while *Hebe* has a flattened smooth “Veronica”-like seed. *Veronicastrum* is most readily distinguished by its well-developed corolla-tube—a feature which comparison with the evolution of other genera (such as *Afzelia* in the Buchnereae) makes me hold as primitive. I believe that here, as in that genus, the open corolla is a phylogenetically recent development. The distribution of *Veronicastrum* in eastern Asia and eastern North America, accords with that of many another ancient race. Yet that it is not directly ancestral to the other living groups is shown by its surprising peculiarity of bearing its leaves in whorls.

After thus excluding *Hebe* and *Veronicastrum*, our restricted group of species has much more coherence. To it I apply the genus-name *Veronica*. Very pronounced is the tendency to a drawing-out of each carpel so as to produce a capsule flattened contrary to the septum, while loculicidal dehiscence has become universal. The capsule tends to become short and bi-lobed. The seeds are flattened and show no trace of reticulation. The corolla-lobes mostly equal or exceed the tube. Progress has reached different apices of evolution in the subgenera to be called *Veronicella* and *Euveronica*.

In *Veronicella* the stem as well as the branches terminates in an indefinite racemose inflorescence, and in this it accords with nearly all of its tribe and with all primitive types of Scrophulariaceae. The flowers may be crowded together, even simulating the close inflorescence of *Veronicastrum*, or may be remote and so what we call “axillary.” Along with this generalized inflorescence we find much diversity of other features. The capsule shows a series of stages from relatively turgid and unnotched to strongly flattened or deeply notched. Associated with the former state, the posterior sepal may be present as smaller or rudimentary, while with the latter it is wholly lost. The leaves, primitively opposite throughout Scrophulariaceae, are always alternate through the inflorescence in *Veronicella* and there is an increasing tendency for nearly all of them to be alternate. From a comparison of various widely scattered genera, it seems probable that in this family annuals have always been developed from perennial ancestry. It is quite in accord with this to find in *Veronicella* that the fifth sepal, unnotched capsule and opposite

leaves occur in the perennial species, while the extreme stages of capsule-lobing and flattening, of few and large seeds, and of alternate leaves are in the relatively few annual sorts. Also, as is the general habit in allied genera, the original *Veronicellas* were surely erect herbs.

In *Euveronica* the stem continues indefinitely as a vegetative axis, its leaves opposite throughout, while the inflorescence is localized in specialized axillary racemes. This is the inflorescence of *Hebe*, but the diversity of capsule-structure tells us that such localization must have originated independently in these two groups. Elsewhere in this tribe I know it only in the Chinese *Botryopleuron* Hemsley, which seems to be separated by little else from *Calorhabdos* Benth. The flowers in the racemes of *Euveronica* are alternate as they are in all inflorescences of *Veronicella*. This accords with the view that these racemes are reduced branches, and not formed by the forking of originally simple pedicels. No stages suggesting the latter alternative are known to exist, and the fact that remote axillary flowers occur in *Veronicella* only in some profoundly modified annual species makes such a derivation very improbable. The species of *Euveronica* are all perennial, and such an erect-growing species as *V. latifolia*, which has a scarcely notched capsule, shows a close approximation in habit to the most primitive group of *Veronicella*, including species such as *V. maritima* and *V. mexicana*.

A few words need be said concerning age and distribution of various species. Contrary to expectation and certain widely advanced theories, it is not those species whose structures proclaim them as most ancient which are necessarily most widely dispersed. Structurally none of our species can make better claim to antiquity than *Veronica mexicana*, yet this species occurs only in a limited area in the mountains of northern Mexico. Obviously it has no close kindred in our flora, and so must, I believe, be considered a relict. Again, *V. Copelandii*, our only other species definitely retaining the posterior sepal, is known from but a few mountains in California. On the other hand, the group of *Veronica alpina* and *V. Wormskjoldii* has a wide range through Temperate North America and Eurasia, although it has become divided geographically into several well-marked species. But it is the obviously non-primitive species which have prospered most and have become or are becoming very widespread. These possess peculiar skill in taking advantage of natural,

or recently of man-made, methods of dispersal. Of species naturally distributed, *Veronica serpyllifolia humifusa* and *V. Anagallis-aquatica* have become nearly cosmopolitan within their respective climates and environments, while carried by human agency and to-day aggressive weeds in our land are *Veronica serpyllifolia*, *V. peregrina* and its variety *xalapensis*, *V. arvensis*, *V. persica*, and *V. officinalis*. To this list, otherwise of Palaearctic origin, America has contributed *Veronica peregrina*, thus showing that the New World may develop sufficiently aggressive plants.

I must thank the curators of the United States National Museum, New York Botanical Garden and Philadelphia Academy of Natural Sciences who have placed their rich collections at my disposal. Also I have seen specimens of certain species from the Gray Herbarium. Probably nearly 4000 sheets have been examined in the present study. It has been with hesitation but I trust to the clearing of the problems involved, that I have ventured so freely into Eurasian botany.

KEY TO GENERA AND SUBGENERA.

- Capsule dehiscing loculicidally, its walls and septum thin. Herbs, the stem dying with the leaves.
 - Corolla white or pinkish, its lobes much shorter than the tube. Capsule acute, longer than wide, not flattened, dehiscing by short apical slits. Seeds slightly reticulate. Plant 10–20 dm. tall, with leaves in whorls of four or five. Main stem terminating in an inflorescence. I. VERONICASTRUM
 - Corolla blue or white, its lobes nearly as long as or usually longer than the tube. Capsule acutish to deeply notched, as broad as or broader than long, more or less flattened contrary to the septum, dehiscing by longer slits which extend at times even to the base. Seeds not reticulate. Plants lower, with leaves, at least the lowermost, opposite, or very rarely in whorls of three or four. II. VERONICA
 - Main stem terminating in an inflorescence, its flowers remote and axillary or densely crowded, in all cases the upper bract-leaves alternate. Subgenus 1. *Veronicella*
 - Main stem never terminating in an inflorescence, the leaves opposite throughout and the flowers all in axillary racemes. Subgenus 2. *Euveronica*
- Capsule dehiscing septocidally, the thick septum splitting and each carpel opening distally by a median slit through the septal wall. Leaves opposite throughout, and flowers all in axillary racemes. Shrubs or small trees, the coriaceous leaves in falling leaving conspicuous scars. III. HEBE

I. **VERONICASTRUM** [Heister] Fabr.

Veronicastrum [Heister] Fabr., Enum. Meth. Pl. Hort. Helmstad. 111. 1759. (Checked only in second edition, 205. 1763.) Type species, *Veronica virginica* L.

1. **Veronicastrum virginicum** (L.) Farwell.

Veronica virginica L., Sp. Pl. 9. 1753. "Habitat in Virginia." Plant grown in the Clifford Garden in Holland, and carefully described by Linné, Hort. Cliff. 7. 1737. No pubescence on leaf mentioned.

Veronicastrum album Moench, Meth. Pl. Hort. Marburg. 437. 1794. ". . . . *Veronica virginica* Linn." Grown in the Marburg Garden, Germany.

Calistachya alba Raf. in Med. Repos. New York. II. 5: 352. 1808. Based on *Veronica virginica* L. Type species of *Calistachya* Raf., not *Callistachys* Vent., 1804.

Veronica quinquefolia Stokes, Bot. Mat. Med. 1: 28. 1812. "In a garden *V. virginica* L." Evidently name chosen as more appropriate than "virginica." Two varieties, or actually forms, *alba* and *incarnata*, are listed.

Leptandra virginica (L.) Nutt., Gen. N. Am. Pl. 1: 7. 1818. Type species of *Leptandra* Nutt.

Eustachya alba Raf., Cat. Ky. 14. 1824. Based upon *Veronica virginica* L. *Eustachya* Raf. in Am. Mo. Mag. 4: 190. 1819, was a new name for *Calistachya* Raf. Name antedated by *Eustachys* Desv., 1810.

Leptandra virginica purpurea Eaton, Man. Bot. ed. V. 275. 1829. "—————" Described as with "flowers purple." Credited to Pursh, who however assigned his color variety no name. According to Pursh, Fl. Am. Sept. 10. 1814: "On the mountains of Virginia I observed a variety with purple flowers."

Leptandra purpurea Raf., Med. Fl. 2: 20. 1830. "Confined to the savannas of the South and the West [of the United States]." Carefully described; a purplish-flowered, single-spiked plant with sessile leaves in whorls of three. Three varieties, or actually forms, named.

Leptandra alba Raf., l. c. 21. 1830. "The most common species, being found all over the United States." Described with white flowers and semi-petiolate leaves in whorls of usually five. Several varieties, or actually forms, named.

Leptandra villosa Raf., l. c. 21. 1830. "Mr. Schriveinitz [Schweinitz] has found it in North Carolina." Careful description of the form with leaf-blades pubescent beneath. This may be considered a forma **villosa** (Raf.) Pennell, comb. nov.

Eustachya oppositifolia Raf., New Fl. Am. 2: 21. 1837. "Mts. Apalaches of Virginia." Apparently an opposite-leaved *virginica*, a form which I have never seen.

Calistachya virginica lanceolata Farwell in Mich. Acad. Sci. Rep. 17: 176. 1915. “Farwell No. 1165, July 18, 1891, from Ypsilanti [Michigan].” A narrow-leaved form.

Veronicastrum virginicum (L.) Farwell, Drugg. Circ. 61: 231. 1917.

Meadows and open woods, from Vermont, southern Ontario and Minnesota to Georgia and eastern Texas. Southward forma *villosa* is more prevalent.

Variable, but certainly one species. Varying in number of leaves in whorl (five, four, rarely three, or in *oppositifolia* even two), in leaf-form from lanceolate to nearly ovate, pubescent or nearly or quite glabrous below (forma *villosa* with whole under surface velvety), in inflorescence being of one or several racemes, and in color of corolla and filaments, varying from white through pinkish to lighter shades of violet-purple.

II. **VERONICA** L., Subgenus 1. VERONICELLA (Fabr.)

Veronicella [Heister] Fabr., Enum. Meth. Pl. Hort. Helmstad. ed. II. 205. 1765. Type species, *Veronica hederaefolia* L., of Europe.

- A. Perennials, from subterranean stems (rootstocks).
Only the upper leaf-axils flower-bearing, so that inflorescence is formed of definite racemes.
- B. Capsules only slightly flattened, even the lowermost on pedicels shorter than the capsule-length: inflorescence appearing a spike. Style two or three times the length of the capsule. Leaf-blades lanceolate. Plants 4–10 dm. tall.
Petals broadly oblong. Leaves opposite or in threes, rarely in fours, 3–15 cm. long, the blades acute to acuminate, dentate-serrate to sharply and somewhat doubly serrate. Plant 4–10 dm. tall.....1. *V. maritima*.
Petals oblong-lanceolate. Leaves always opposite, 3–6 cm. long, the blades acutish, crenate or crenately serrate. Plant 2–4 dm. tall.....2. *V. spicata*.
- B'. Capsules strongly flattened, the lowermost on pedicels nearly or quite as long as the capsule-length; inflorescence obviously a raceme. Style slightly, if at all, longer than the capsule.
- C. Capsule as long as or longer than wide, less deeply or not notched. Corolla violet-blue, rarely nearly white, glabrous within. Leaf-blades obtuse, acutish to acuminate. Stems erect, nearly or quite from the base.
Calyx 5-parted, the posterior lobe over half the length of the others. Leaf-blades lanceolate, acuminate, irregularly dentate. Plants 5–6 dm. tall.....3. *V. mexicana*.
Calyx 4-parted, or with a rudiment of the fifth lobe. Leaf-blades ovate to oblanceolate, obtuse to acutish, entire to serrate. Plants less than 3 dm. tall.

Style longer than the capsule. Filaments equaling or exceeding the corolla. Calyx-lobes unequal, the anterior longer. Leaf-blades entire.

Leaf-blades oblong-elliptic, hirsute-pubescent, acute. Sepals five, the posterior much the smallest, the others slightly unequal. Capsule scarcely notched. Corolla 5 mm. long.....4. *V. Copelandii*.

Leaf-blades elliptic-oval, glabrous or glabrate, obtuse to acutish. Sepals four, decidedly unequal. Capsule strongly notched. Corolla 5-7 mm. long.....5. *V. Cusickii*.

Style shorter than or nearly as long as the capsule. Filaments shorter than the corolla. Calyx-lobes of uniform length. Leaf-blades, at least the lower, crenate to serrate.

Capsule rounded or acutish, not notched. Style nearly as long as the capsule. Sepals canescent, not ciliate, nearly equaling the capsule. Corolla twice as long as the sepals. Stem-leaves elliptic-oblong. Plant 1 dm. tall or less, the inflorescence minutely pubescent.....6. *V. fruticans*.

Capsule slightly notched. Style less than half the length of the capsule. Sepals conspicuously ciliate, one-half to two-thirds the length of the capsule. Corolla less than twice as long as the sepals. Stem-leaves elliptic to ovate. Plants mostly 1-3 dm. tall, the inflorescence hirsute-pubescent.

Capsule glabrous. Sepals glabrous on back, ciliate on margins with non-glandular hairs. Plant usually 1-2 dm. tall.....7. *V. alpina*.

Capsule pubescent. Sepals usually pilose on back as well as margins.

Leaf-blades serrate, the largest nearly cordate at base. Capsule and sepals with hairs which have attenuate non-glandular tips, the sepals less pilose or glabrous on back. Plant usually 1-1.5 dm. tall, with pedicels becoming 8-11 mm. long.....8. *V. Stelleri*.

Leaf-blades crenate-serrate to nearly entire, rounded at base. Capsule and sepals with hairs which have rounded glandular tips, the sepals densely pilose on back. Plant usually 1.5-3 dm. tall, with pedicels 2-5(-10) mm. long.

Corolla mostly 6-7 mm. long. Pedicels mostly 5-10 mm. long. Leaf-blades mostly ovate, frequently serrate....9a. *V. Wormskjoldii nutans*.

Corolla mostly 4–6 mm. long. Pedicels mostly 2–5 mm. long. Leaf-blades mostly oblong-ovate, rarely evidently serrate...9. *V. Wormskjoldii*.

C'. Capsule obviously wider than long, notched one-fourth length. Corolla white or bluish, with deep-blue lines on the posterior side, the tube pubescent within. Style nearly as long as the capsule. Leaf-blades ovate-oblong or oval, obtuse, obscurely crenate. Stems extensively repent, ascending at apex.

Stem throughout and pedicels minutely pubescent with upcurved hairs. Corolla about 2 mm. long, white or whitish, with blue lines on posterior side. Capsule mostly 3–4 mm. wide.....10. *V. serpyllifolia*.

Stem distally and pedicels finely pubescent with longer mostly spreading hairs. Larger throughout, the corolla mostly about 3 mm. long, pale-bluish with deeper blue lines on posterior side. Capsule mostly 4–5 mm. wide.....10a. *V. serpyllifolia humifusa*.

A'. Annuals, fibrous-rooted, but without subterranean stems. Most leaf-axils flower-bearing, so that inflorescence appears to be of “axillary” flowers.

B. Pedicels shorter than the lanceolate to linear sepals. Capsule strongly flattened. Seeds many, less than 1 mm. long, flat, smooth or nearly so. Plants erect.

Leaf-blades, excepting the lowermost, sessile, those of the lower stem-leaves oblanceolate, nearly entire to dentate. Corolla whitish throughout. Capsule greenish, notched, the minute style hidden between the capsule-lobes. Plant glabrous or with minute usually gland-tipped hairs.

Plant glabrous.....11. *V. peregrina*.

Plant pubescent with short gland-tipped hairs, which are usually present even on the capsule.....11a. *V. peregrina xalapensis*.

Leaf-blades petioled, or the upper nearly sessile, those of the lower stem-leaves ovate, crenate-serrate. Corolla deep violet-blue. Capsule yellowish-brown, pubescent with slightly gland-tipped hairs, strongly flattened, notched nearly or about one-third length, the longer style reaching about to the capsule-lobes. Plant pubescent with white glandless or obscurely gland-tipped hairs.....12. *V. arvensis*.

B'. Pedicels longer than the ovate sepals. Capsule relatively turgid. Seeds few, 1.3–3 mm. long, convex-arched, roughened. Plants repent.

Leaf-blades ovate, serrate to dentate. Sepals shortly ciliate. Capsule slightly flattened, deeply notched, pubescent. Seeds 1.3–1.5 mm. long, brown.

Capsule-lobes united at least two-thirds their length. Leaf-blades dentate, truncate or cordate at base. Stem finely pubescent with glandless hairs.

- Petals not exceeding the ovate sepals. Capsule-lobes rounded, the most distal point of each about midway between the style and the lateral margin. Style shorter than the capsule.
- Leaf-blades oblong-ovate, crenate-serrate. Capsule 4–5 mm. wide, with a narrow notch about one-third depth of capsule; the stout style (less than 1 mm. long) about equaling the capsule-lobes.....13. *V. agrestis*.
- Leaf-blades ovate, dentate with rounded teeth. Capsule 4 mm. wide, less deeply and narrowly notched; the slender style (1–1.5 mm. long) surpassing the capsule-lobes.....14. *V. polita*.
- Petals much exceeding the narrowly ovate sepals. Capsule-lobes acutish in profile, the most distal point of each near the lateral margin. Style as long as the capsule.....15. *V. persica*.
- Capsule-lobes united only at base. Leaf-blades serrate, narrowed at base. Stem pubescent with gland-tipped hairs.....16. *V. biloba*.
- Leaf-blades broadly and shallowly cordate, 3–5-lobed, the lobes rounded and entire. Sepals broadly ovate, conspicuously ciliate. Capsule turgid, scarcely notched at apex, glabrous. Seeds 2.5–3 mm. long, blackish..17. *V. hederifolia*.

1. VERONICA MARITIMA L.

Veronica maritima L., Sp. Pl. 10. 1753. "Habitat in maritimis Europae macris apricis." According to Linné, Fl. Lapp. 5. 1737: "Ad fines Alpium Lapponicarum iuxta mare septentrionale saepius conspicitur, in toto itinere nullibi copiosior visa est, quam in maritimis Tornoensibus." Type carefully described by Sir. J. E. Smith, and specimen from Tornea, collected by C. P. Laestadius, seen in Herb. New York Botanical Garden. This is a form with long-acuminate, sharply serrate leaves.

Veronica longifolia L., l. c. 10. 1753. "Habitat in Tataria, Austria, Svecia." Diagnosis quoted from Linné, Hort. Ups. 7. 1748, where this plant is more fully described and is cited: "Habitat in Tataria." Sir J. E. Smith, in Rees Cyclop. 37: Art. Veronica, no. 10, 1819, discussing the specimens in the Linnean Herbarium, carefully contrasts these two Linnean species. *V. longifolia* he distinguishes by its leaves less deeply and doubly serrate, on shorter petioles, and calyx shorter (not longer) than the tube of the corolla, its lobes broad, ovate and nearly equal (not unequal and narrow). All which contrasts certain plants; however each character varies, and it seems difficult or impossible to distinguish these as species.

Roadsides and waste land, from the Magdalen Islands and Prince Edward Island to Quebec, Connecticut and central New York. Introduced from northern Eurasia.

What is here termed *Veronica maritima* presents remarkable variability, and whether it constitutes one polymorphic species, one species with varieties, or a group of closely related species, must be decided by field-study in the lands in which it is native. Until Old World students arrive at a much more definite consensus of opinion, there seems to be slight profit in our attempting further analysis and identification of the large number of named variants of this group. But to show the range of variation seen in American material I present this doubtless artificial outline of forms:

- Corolla (of at least largest flowers) 5.5–7 mm. long. Filaments much exceeding the corolla. Leaves opposite or in threes, 6–15 cm. long, long-acuminate, sharply serrate.
- Leaf-blades beneath pubescent over most of surface. The most prevalent form northward, Magdalen Islands and Nova Scotia to Massachusetts and northern New York..... *Forma A*
- Leaf-blades beneath glabrous or slightly pubescent on veins. In Nova Scotia and Massachusetts. Evidently a mere variant of Forma A *Forma B*
- Corolla 4–5.5 mm. long.
- Leaf-blades beneath pubescent over entire surface and usually also above. Filaments nearly twice as long as the corolla.
- Leaves in threes or fours, 8–10 cm. long, the blades linear-lanceolate, long-acuminate, sharply serrate. Buckfield and Cliff Island, Maine. Probably the typical *V. maritima* L. As in Forma A, but smaller-flowered..... *Forma C*
- Leaves opposite, 3–5 cm. long, the blades oblong-lanceolate, acute, dentate-serrate. In Quebec, Massachusetts, and central New York..... *Forma D*
- Leaf-blades beneath glabrous, or slightly pubescent on the veins, lanceolate, or oblong-lanceolate.
- Leaves opposite, or very rarely in threes, 3–10 cm. long, the blades acuminate or acute, dentate-serrate or somewhat sharply serrate. Filaments usually only slightly longer than the corolla. The most prevalent form southward, and possibly a distinct species. On Prince Edward Island; from Maine to Vermont and Connecticut; in Martinique..... *Forma E*
- Leaves opposite, 5–8 cm. long, the blades obtuse or acutish, crenate-serrate. Filaments much exceeding the corolla. An anomalous form, perhaps a hybrid containing some *Veronica spicata* ancestry. Elmira, New York..... *Forma F*

Perhaps even the little-understood *Veronica spuria* L. is to be included in this aggregate species. If so, as this name has precedence of position, according to the American Code¹ it must be adopted. *Veronica spuria* L., Sp. Pl. 10. 1753 (“Habitat in Europa australiore,

¹ Priority of position within a work, or as in this case on a single page, affords an unfortunate rule to follow, because it does not indicate any time-precedence in the author’s mind. Perhaps a better principle would be to select, among ‘species’ actually seen by the author, that earliest known by him. In the case above, Linné knew *Veronica spuria* and *longifolia* from 1748, but *V. maritima* from 1737.

Siberia"), is really adopted from Linné's Hortus Upsalensis, where the plant is more fully described, contrasted with *V. maritima*, and stated to be from Siberia. A plant with stems and under surface of leaves glabrous, the latter with acute (not acuminate) serratures, from Siberia, would appear to be the same as certain specimens seen in Herb. New York Botanical Garden from Altai and Manchuria. These all have very short petioles, a feature especially stressed by Sir J. E. Smith in his re-description of the Linnean plant, and so appear to be in contrast with any form seen of *V. maritima* L. It will be noticed that this interpretation of *Veronica spuria* L., is not that of Ledebour, Fl. Ross. 3: 231. 1846, and others, who hold the name for a plant with leaves narrowed at base.

2. *VERONICA SPICATA* L.

Veronica spicata L., Sp. Pl. 10. 1753. "Habitat in Europae borealis campis." A specimen was in the Linnean Herbarium in 1753, and the plant is included in Flora Suecica from Sweden. Several specimens from Sweden seen in Herb. New York Botanical Garden.

Roadside, Stockholm, northern New York. Introduced from northern Eurasia.

3. *Veronica mexicana* S. Wats.

Veronica mexicana S. Wats. in Proc. Am. Acad. 23: 281. 1888. "On cool damp bluffs of streams in the Sierra Madre, Chihuahua, C. G. Pringle (n. 1349), Sept., 1887." Isotype² seen in Herb. Columbia University at New York Botanical Garden.

Mountain slopes, at altitudes of 1950 to 2400 meters; Sierra Madre of southern Chihuahua and Durango.

4. *Veronica Copelandii* Eastw.

Veronica Copelandii Eastw. in Bot. Gaz. 41: 288. f. 2. 1906. "Collected on Mount Eddy [California] at an elevation of 2500^m by Dr. Edwin Bingham Copeland, August 18, 1903, distribution of C. E. Baker, 1903, no. 3931." Isotype, collected on Mount Eddy, Siskiyou County, and distributed by C. F. Baker, seen in Herb. New York Botanical Garden.

Alpine slopes, known only from the mountains of Siskiyou, and perhaps adjoining counties in northern California.

5. *Veronica Cusickii* A. Gray

Veronica Cusickii A. Gray, Syn. Fl. N. Am. 2¹: 288. 1878. "Alpine region of the Blue Mountains, W. Oregon. W. C. Cusick."

²The word "Isotype" is used to designate a specimen of the original collection, other than the type itself. See Torrey 19: 13. 1919.

Veronica Allenii Greenm. in Bot. Gaz. 25: 263. 1898. “Collected by O. D. Allen along Paradise river on Mt. Rainier [Washington], altitude 1700^m, August 20, 1897, no. 95a.” Isotype seen in Herb. New York Botanical Garden. Differs, as stated by Greenman, “in its smaller flowers, the white corolla, and less exerted stamens and style.” As stated by Macbride and Payson, “typical *V. Cusickii* is common on Mt. Rainier,” so that it seems probable that *Allenii* is better considered as an albino form, forma **Allenii** (Greenm.) Pennell, comb. nov. However the single collection known differs from *V. Cusickii* by the following contrast: corolla 3–4 mm. long, white (not 5–6 mm. long, blue), and sepals less unequal. The plant should be re-collected and studied.

Veronica Cusickii Allenii (Greenm.) Macbr. & Pays. in Contrib. Gray Herb. II. 49: 67. 1917. I should not consider an albino state, occurring with its species, as of rank higher than forma.

Mountain slopes, Cascade and Olympic mountains of Washington eastward to Coeur d’Alene Mountains of northern Idaho and Blue Mountains of northeastern Oregon.

6. *Veronica fruticans* Jacq.

Veronica fruticans Jacq., Enum. Stirp. Vind. 2,200. 1762. “Crescit copiose in herbidis saxosisque montium Schneeberg, Schneealbl, Gans. &c. [Austria].” Description of calyx as covered with a very light pubescence, of the corolla as larger than *V. alpina* (by which name *V. pumila* Allioni is intended) and more blue, indicate that this name belongs to the plant now discussed rather than to *V. fruticulosa* L. The Greenland plant has been known by the later name *Veronica saxatilis* Scop.

East Greenland (Lange), and on Disco Island, West Greenland. Through the mountains of western Eurasia, Scandinavia, Scottish Highlands and Alps.

VERONICA FRUTICULOSA L., Sp. Pl. ed. II. 15. 1762. (“Habitat in Alpibus Austriae, Helvetiae, Pyrenaeis”.) From Linné’s brief description, the description and plate of Haller cited (Stirp. Helv. 1: 532. pl. 9. 1742), the south European range assigned, and the identification by Sir. J. E. Smith (in Rees Cyclop. 37: Art. Veronica, no. 20) who had Linné’s specimen before him, this name must be held for the pink-flowered, larger, slightly glandular-pubescent, longer- and at times dentate-leaved plant of the Alps and Pyrenees. Linné’s description of the calyx as glabrous is apparently inaccurate, as this is somewhat glandular-pubescent. Scopoli, in his Flora Carniolae, ed. II. 1: 11 and 19. 1772, well contrasts *Veronica fruticulosa* and *V. fruticans*, although describing both as new species from Carniola.

The former, his *V. frutescens*, is a plant of lower and subalpine stations, while the latter, his *V. saxatilis*, is truly alpine. For contrasting illustrations see Reichenbach, Ic. Fl. Germ. et Helv. 20: pl. 1717. 1862.

7. *Veronica alpina* L.

Veronica alpina L., Sp. Pl. 11. 1753. "Habitat in alpinis Europae." Based primarily upon the plant described in Linné, Fl. Suec. 5. no. 13. 1745, where the locality is stated: "Habitat in Alpinis Lapponicis monte Wallewari." This in turn is based upon Linné, Fl. Lapp. 7. no. 7. pl. 9. f. 4. 1737, where Linné's own Lapland plant is well described and illustrated. Obviously the name must be given to the species of northern Europe now considered, Linné using the term "alps" as applicable to any high mountain.

Veronica alpina corymbosa Hornem., Fl. Dan. fasc. 33: 3. pl. 1921. 1829. "Auf der Insel Disco in Groenland. Gefunden von Capitain-Lieutenant Holbøll." Figured as with an abbreviated, but obviously young raceme. Specimen from Disco Island seen in Herb. New York Botanical Garden.

Open slopes, East Greenland. Also in Scandinavia, and the Highlands of Scotland.

Under this name have long been included two species which may be distinguished as follows:

- | | |
|---|------------------|
| Capsule glabrous. Sepals glabrous on back, ciliate on margins, apparently but little shorter than the corolla. Plant usually 1-2 dm. tall, usually little branched at base | <i>V. alpina</i> |
| Capsule pubescent with glandless hairs. Sepals pilose on back as well as margins, much shorter than the corolla. Plant usually .5-1 dm. tall, usually much branched at base | <i>V. pumila</i> |

VERONICA PUMILA Allioni, Fl. Pedem. 1: 75. pl. 22. f. 5. 1785 ("In saxosis summae alpis Albergian dictae"), is stated by Allioni to differ from "*Veronica alpina*" of the Italian Alps, in its leaves 'not crenate, but dentate, rugose and more acute.' Individual variants of the South European "*alpina*" answer this characterization, and Bertolini, in his *Flora Italica* 1: 89. 1833, assures us that he has obtained specimens proving this to be but a state. Frequently the leaves of variants are dentate and more acute.

This is the species known as "*Veronica alpina*" through southern Europe, the Pyrenees, Cevennes, and Alps, and as var. *lasiocarpa* in northern Europe, Scandinavia, and the Highlands of Scotland. Wahlenberg, in his *Fl. Carpat. Princip.* 5. 1814, called this *Veronica alpina australis*, and the true "*alpina*" *V. alpina lapponica*.

8. *Veronica Stelleri* Willd.

Veronica Stelleri Willd.; Link, Jahrb. 1³: 40. 1820. "In Herbar. [Willdenow bei Berlin] aus Kamtschatka von Pallas gesandt." Accord-

ing to Chamisso and Schlechtendahl, in *Linnaea* 2: 557. 1827: “*Veronica Stelleri* Pallas in *Herb. Willd.* n. 192. . . . quam e Camtschatca et e Curilis Pallas habuit, in Unalaskha insula Aleutorum legimus frequentem.” By them very fully described, and contrasted with their *V. alpina unalaskensis*. Specimen from “Mts. of Unalaska, 2000 ft.,” collected by A. Kellogg no. 295, seen in United States National Herbarium.

On the Aleutian and Pribiloff Islands, Alaska.

9. *Veronica Wormskjoldii* Roem. & Schult.

Veronica Wormskjoldii R. & S., *Syst.* 1: 101. 1817. “*V. villosa* Wormskjold In Grönlandia.” Evidently the species now considered.

Veronica alpina unalaskensis C. & S. in *Linnaea* 2: 556. 1827. “Legimus [Chamisso et Eschscholtz] in montosis insulae Unalaskha Aleutorum.” Collections from Unalaska made by C. F. Baker 4988, W. L. Jepson 86, 135, C. H. Merriam in 1891, and C. V. Piper 4527, seen.

Veronica alpina Wormskjoldii (R. & S.) Hook. in *Bot. Mag.* 57: pl. 2975. 1830.

Veronica mollis Raf., *New Fl. Am.* 4: 38. 1838. “From Oregon, seen alive in gardens.” Apparently this species is intended, but the flowers are described as “pale blue” and “large.”

Veronica alpina villosa (Wormskj.) Lange, *Consp. Fl. Groenl.* 261. 1887. “(*V. villosa* Wormskj. mscr.) V. Gr. [West Greenland]: Avangnardlek 62° 25' (Holst.).”

Moist, grassy ledges and meadows, West Greenland, northern Labrador, Gaspé County, Quebec, Hudson Bay, and Alaska, southward, in the east on Mt. Katahdin, Maine,³ and the White Mountains, New Hampshire, in the west through the Rocky Mountains to northern New Mexico, the San Francisco Mountains of Arizona and the Ruby Mountains of Nevada, and through the Cascade Mountains and Sierra Nevada to California.

There appears to be a tendency for plants of the Pacific ranges from Alaska to California to have styles slightly longer, usually $\frac{1}{4}$ to $\frac{1}{3}$ the length of the capsule, rather than $\frac{1}{6}$ to $\frac{1}{4}$. Northward is the following more pronounced variant.

9a. *Veronica Wormskjoldii nutans* (Bong.) Pennell, comb. nov.

Veronica nutans Bong. in *Mém. Acad. Petersb.* 2: 157. 1833. “Dr. Mertens a . . . cueillies a l’île de Sitcha.” An old specimen in *Herb. Columbia University* labeled simply “*Veronica nutans* Bong. Sitcha,” may be an isotype.

³ Reported by Fernald, in *RHODORA* 3: 176. 1901 (as *V. alpina* L.).

Along the Alaskan coast from Sitka to Kodiak Island, while northward and on the mountains inland typical *Wormskjoldii* occurs.

10. *VERONICA SERPYLLIFOLIA* L.

Veronica serpyllifolia L., Sp. Pl. 12. 1753. "Habitat in Europa & America septentrionali ad vias, agros." Specimen in the Linnean Herbarium, and plant cited in the Flora Suecica as occurring "in pascuis sterilioribus riguis frequens," are evidently of the species now considered.

Meadows, barrens and open woodland, from Newfoundland and Ontario to Minnesota, South Carolina and Missouri, mostly common; British Columbia; Costa Rica; Jamaica; Venezuela. Introduced from western Eurasia, or perhaps also native, in which case our plant, which is not montane, would appear to have been independently derived from the wide-spread mountain variety, *humifusa*.

10a. *Veronica serpyllifolia humifusa* (Dickson) Vahl.

Veronica humifusa Dickson in Trans. Linn. Soc. 2: 288. 1794.

"I found [it] upon very high mountains, and under wet shady rocks [Scotland. James Dickson in 1789]." Description not intended to apply to the variety now considered, but to a depressed form of it. Also is inaccurate (as stated by me in *Torreyia* 19: 166. 1919) in calling for a plant with leaves often in threes and fours, a condition which I have not observed within this species. However this must be a form of *serpyllifolia*, and this name has long been current in British floras for denoting an alpine more pubescent depressed variety of that species. Surely the depressed habit must prove ecologic, but, as understood long ago by Sir J. E. Smith (*Fl. Brit.* 1: 19. 1800), there is a hirtous *V. serpyllifolia* in the upland, "in montosis." Four specimens in Herb. Columbia University, collected along streams in the Clava Mountains, Forfarshire, Scotland, show well this variety. The stems are but 5 cm. long, ascending or even erect at apex, and above are pubescent with spreading hairs. That the plants are but dwarves of this wide-spread variety is confirmed by their obviously large corollas. The plants are so dwarfed that, due to the crowding of the pairs, the leaves might seem whorled.⁴ American plants from high altitudes become likewise dwarf and spreading.

Veronica neglecta F. W. Schmidt, *Fl. Boem.* 1: 12. 1794. Description not seen, but in Roemer & Schultes, *Syst. Veg.* 1: 102. 1817, we are informed that *neglecta* is "hirsuta, pilis brevibus confertis," while Koch, *Syn. Fl. Germ. et Helv.* 529. 1837, terms it a "forma maior, fol. ovatis." This combined description surely indicates our plant.

⁴ Prof. Fernald has suggested that Dickson intended to describe his plant as bearing three or four pairs of leaves.

Veronica serpyllifolia humifusa (Dickson) Vahl, Enum. Pl. 1: 65. 1805.

Veronica ruderalis Vahl, l. c. 66. 1805. “Habitat in ruderalis versuris et humidis locis frigidis Peruviae.” Re-naming, with a rearranged description, of the plant called by Ruiz and Pavon (Fl. Peruv. et Chil. 1: 6. 1798) “*Veronica serpillifolia*” and obtained by them “in ruderalis, versuris et humidis locis frigidis Pillao [Peru].” Description distinctive of the variety now considered.

Veronica serpyllifolia neomexicana Cockerell in Am. Nat. 40: 872. 1906. “I found it at the top of the Las Vegas Range in New Mexico, at 11,000 feet, June 28, 1902.” Isotype seen in Herb. New York Botanical Garden.

Veronica funesta Macbr. & Pays. in Contrib. Gray Herb. II. 49: 68. 1917. “Oregon: Swan Lake Valley, June 21, 1896, Elmer I. Applegate, no. 424 (Type, Gray Herb.).” Type, collected “along mountain streams,” seen in Gray Herbarium. The filaments are obviously shorter than in *V. Cusickii* A. Gray, and the (immature) capsule is wider than long.

Alpine meadows, reaching sea-level northward, from Labrador to Alaska, south, eastward to northern Maine and Vermont, westward through all high ranges of Canada and the United States, at scattered stations in Mexico⁵ (Popocatepetl and Ixtaccihuatl), and through the Andes from Colombia to Bolivia. Through the mountains of Eurasia, from Scandinavia, Scotland and the Pyrenees to the Himalayas. Very wide-ranging, and certainly the parent of the species, *V. serpyllifolia*.

In Eurasian botany this pubescent larger-flowered plant of mountains has repeatedly been distinguished from *Veronica serpyllifolia*, specifically, varietally, or as but a mountain-form of that species. Among names proposed for it are: *Veronica serpyllifolia pubescens* Spenner, Fl. Frib. 351. 1826, from Germany; *V. serpyllifolia borealis* Laestad. in Nov. Act. Soc. Ups. 11: 211. 1839, from Sweden; *V. serpyllifolia major* Baumg., Enum. Stirp. Transsilv. 1: 20. 1816, from Transsilvania; *V. serpyllifolia major* Schur., Enum. Pl. Transsilv. 500. 1866, also from Transsilvania (name apparently independently chosen; plant well-described); and *V. serpyllifolia alpina* Hook., Brit. Fl. 4. 1830, from Scotland. *Veronica fontana* Willd.; Link, Jahrb. 1³: 41. 1820, is a name which has been used in Alaskan botany.

⁵ To be expected on all high cordilleras of Mexico and Central America.

11. *Veronica peregrina* L.

Veronica peregrina L., Sp. Pl. 14. 1753. "Habitat in Europae hortis, arvisque." Diagnosis quoted from Linné, Fl. Suec. 6. no. 15. 1745, where we are told that the plant "habitat in cultis & terra nuda Upsaliae, rarissima apud nos hodie plana, olim forte copiosior evasura." A plant of 'cultivated fields and bare earth,' known from a single locality in Sweden, and there 'formerly abundant but now very rare,' would seem to have been an adventive. That this was Linné's opinion is shown by the specific name chosen, meaning "foreign."

Veronica caroliniana Walt., Fl. Carol. 61. 1788. Type doubtless from lower South Carolina. The radical leaves are described as subincised, cauline subserrate. Evidently this is a pronounced phase of the 'romana' type, discussed below, and it is well-interpreted by such a specimen as House 3179 from Clemson College, South Carolina.

Veronica carnulosa Lam., Ency. Meth., Illust. 1: 47. 1791. "Ex Europa & America septentr. in arvis."

Moist soil, river-banks, gardens and cultivated fields, usually appearing as a weed; wide-spread through eastern North America from New Brunswick to Iowa, Florida and Texas; also seen from British Columbia, Alaska, New Mexico, Oregon, Bermuda and Jamaica. Westward passes into the yet more widely ranging variety *xalapensis*.

In the Species Plantarum, 1753, Linné twice described this species, once from plants known living to him, as *Veronica peregrina*, and once from a specimen from southern Europe in his herbarium as *V. romana*. *V. peregrina* was supposed to possess leaves lanceolate-linear and very entire, while *V. romana* had these oblong and subdentate. The leaves of this species vary from one state to the other, and on each individual the larger leaves tend to the "romana" type. As *romana* has priority of position on page 14 of the Species Plantarum, and its diagnosis is descriptive of a specimen in the Linnean Herbarium, a claim might be made that this name should be used for our plant. However the citations in the synonymy of *V. romana* all pertain to another species, later separated by Linné as *Veronica acinifolia* (Sp. Pl. ed. II. 19. 1762), and the specific name "romana" was adopted from "Veronica minima, clinopodii minoris, folio glabro, romana. Bocc. mus. 2. p. 29. t. 102." As the Linnean diagnosis would also include Boccone's plant, which was clearly illustrated in the latter's Museo di Pianta Rare della . . . Italia . . . 19. pl. 102. 1697, I think we should hold *romana* for this species, placing *acinifolia* in its synonymy.

11a. *Veronica peregrina xalapensis* (H.B.K.) Pennell

Veronica xalapensis H.B.K., Nov. Gen. et Sp. 2: 389. 1818. “Crescit in Regno Mexicano prope Xalapa (alt. 630 hex.) in nemoribus Liquidambaris Styracifluae [Humboldt & Bonpland].”

Veronica chillensis H. B. K., l. c. 390. 1818. “Crescit in cultis Regni Quitensis prope Chillo, alt. 1340 hex. [Humboldt & Bonpland].” Described as differing from *V. xalapensis* in having stem repent, leaves wider (oblong-spatulate instead of oblong), and calyx-lobes narrower (lanceolate instead of oblong), at length reflexed. All these are points of normal variation in this variety, excepting that the plant is never truly repent. In the full description the word “repentes” is followed by the truer statement “adscendentes.”

Veronica peregrina xalapensis (H.B.K.) Pennell in *Torreyia* 19: 167. 1919.

Environment as in *Veronica peregrina*, with which over an extensive area transitional forms occur; wide-spread and usually common through western North and South America from Alaska and Yukon to Chile and Argentina, in the Tropical portions of its range found only on the upper Cordilleras; eastward, in the United States frequent nearly to the Mississippi River, and sporadically eastward, probably as an introduction, to New England; also, probably also introduced, in Brazil.

12. *VERONICA ARVENSIS* L.

Veronica arvensis L., Sp. Pl. 13. 1753. “Habitat in Europae arvis, cultis.” Diagnosis quoted from Linné, Fl. Suec. 6. no. 16. 1745, where we are told that the plant occurs in Sweden “in agris ruderalis cultis frequens.” Our American introduced plant agrees well with the description of this.

Gardens and fields, or in dry woods, on cliffs and talus slopes, mostly common from Newfoundland to Iowa, Georgia and Oklahoma; southern Alaska to Oregon; Bermuda; Jamaica; Argentina. Introduced from Eurasia.⁶

13. *VERONICA AGRESTIS* L.

Veronica agrestis L., Sp. Pl. 13. 1753. “Habitat in Europae cultis, arvis.” Diagnosis quoted from Linné, Fl. Suec. 6. no. 17. 1745, where the plant is said to occur in Sweden “in agris, arvis,

⁶ This species frequently grows in such “native” environments that the question of its being indigenous to the Northeast has been raised. But its weed-like character, ensuring its early introduction, and the fact that its American range is not so great as would be expected of such a species if native, leads me to think it introduced. See also Fernald in *RHODOBA* 2: 137. 1900. In the case of this and *Veronica officinalis* L., below, the burden of proof is on those who would claim them indigenous to both hemispheres.

cultis." According to the statement of Fries, Novit. Fl. Suec. 65. 1819, the Linnean *agrestis* is identical with his own *V. versicolor*, being the only one of Fries' segregates common or previously known in Sweden. Two specimens from Sweden seen in Herb. New York Botanical Garden, one collected at Scania by N. H. Nilsson in 1881.

Roadsides and rocky places, Newfoundland to Quebec and New Brunswick; on ballast at New York City and Philadelphia; Bermuda. Introduced from central and northern Europe.

14. VERONICA POLITA Fries

Veronica polita Fries, Novit. Fl. Suec. 63. 1819. "Ubique in arvis Scaniae [Sweden]." In the second edition of the Novitiae we are told that this is the only known station in Sweden. Well described, and in the second edition contrasted with the *V. agrestis* L. (*V. versicolor* Fries), both of which species of Fries were soon after illustrated in Reichenbach's Kupfersammlung kritischer Gewächse, plates 246 and 277 respectively. I am unable to maintain Fries' contrast as to pubescence and the veining of the sepals. For further discussion of this name and of the uncertain identity of the older *Veronica didyma* Tenore, Prod. Fl. Nap. 6. 1811, of Italy, see Ernst Lehmann in Bull. Herb. Boiss. II. 8: 237-244. 1908. Tenore's mention of leaves profoundly crenate suggests *polita*, which is the species of this group commonest in southern Italy.

Veronica crenulata Sesse & Mociño, Fl. Mex. 5. 1892. "Habitat in montibus Sancti Eremitae PP. Carmelitarum [Mexico. Mociño & Sesse]." Description appears to be of the species now considered, which is well-established in Mexico. Not *V. crenulata* Hoffm., 1803.

Ballast, roadsides and gardens, occasional from New York to Ohio, Florida and Texas; central Mexico; Argentina. Introduced from central and southern Eurasia.

15. VERONICA PERSICA Poir.

Veronica persica Poir., Encyc. Meth., Bot. 8: 542. 1808. "Croît dans la Perse. On la cultive au Jardin des Plantes de Paris (V. v.)." Apparently this is our species, but description differs from prevalent forms in stating the leaves to be very obtuse and ordinarily slightly longer than the pedicels and the corolla to be shorter than calyx. However these states are easily reconcilable to certain stages or forms, and our species is a plant well-known from Persia. Lehmann doubtfully identifies *persica* as this species, but Lacaïta (in Jour. Bot. 56: 55. 1918), after examination of Poiret's type, declares these identical.

Veronica precox Raf., Atl. Jour. 79. 1832. "Grown in the [Bartram's Botanic] Garden [near Philadelphia] from seeds received from a place unknown." Not *V. praecox* All., 1789.

Veronica diffusa Raf., New Fl. Am. 4: 38. 1838. “Native of _____, naturalized on the Schuylkill near Philadelphia.”
Re-naming of *V. precox* Raf.

Veronica rotundifolia Sesse & Mociño, Fl. Mex. 5. 1892. “Habitat in Eremo P. P. Carmelitarum [Mexico, Mociño & Sesse].” Description apparently of the species now considered, although it may be that I have transposed the application of this name and *V. crenulata* S. & M. Not *V. rotundifolia* Ruiz & Pavon, 1798.

Fields and roadsides, occasional, or westward locally common, through Temperate North America, from Newfoundland and southern Alaska, south to Georgia, Texas and California; Mexico; Jamaica; Colombia; Chile. Introduced from southern Eurasia.

Our plant has also been known as *Veronica Tournefortii* C. C. Gmel., *V. Buxbaumii* Tenore, and *V. byzantina* (Smith) B.S.P. The two last are subsequent names, dating as species from 1811 and 1888 respectively. The original description of *V. Tournefortii* C. C. Gmel., Fl. Bad. 1: 39. 1805, was composite, based upon a plant escaped from the botanic garden to fields near Karlsruhe, Baden, and upon a specimen brought by Tournefort from the Levant, which had recently been described as *V. filiformis* Smith (in Trans. Linn. Soc. 1: 195. 1791.). The former element was probably our species, but the name *Tournefortii* should be applied to Tournefort’s plant, and this is the basis of *V. filiformis*, a distinct though related species. Moreover the name was antedated by *Veronica Tournefortii* F. W. Schmidt, Fl. Boem. 7. 1793. (Description not seen, but the publication of this name verified by Lacaíta in his discussion of this whole problem in Jour. Bot. 55: 271–276. 1917.)

16. VERONICA BILOBA L.

Veronica biloba L., Mant. 172. 1771. “Habitat inter Cappadociae segetes. D. Schreber.”

Collected at Yonkers, New York, by E. P. Bicknell; also at Logan, Utah, by C. P. Smith, 1604 and 2167, and by him commented upon (under the name of *V. campylopoda* Boiss.) and illustrated in comparison with *V. persica* Poir., in Muhlenbergia 6: 61. 1910.

Veronica campylopoda Boiss., Diagn. Pl. Nov. 4: 80. 1844, distinguished from *V. biloba* as having its leaves and sepals narrower, the former hardly denticulate to entire above, its pedicels recurved, its seeds strongly rugulose and its style longer, half the length of the capsule, seems not to be definitely separable by any of these charac-

ters. Sir J. D. Hooker, Fl. Brit. India 4: 295. 1884, assures us that the plant lacks distinctness—"I cannot distinguish it as a variety even"—and in confirmation of his statement that "the seeds vary much in depth of pitting," it may be mentioned that Reichenbach's plate cited by Boissier as illustrative of true *biloba* shows seeds deeply rugulose. Our plants seem quite intermediate, with the leaf-breadth and leaf-serration of *biloba*, but with the pedicels tending slightly to recurve and with the seeds and style as described for *campylopoda*. They match well a specimen of Boissier's collected at Roscheya, Syria, May, 1846, and named by him *Veronica campylopoda*.

17. VERONICA HEDERAEFOLIA L.

Veronica hederæfolia L., Sp. Pl. 13. 1753. "Habitat in Europæ rudèratis." Diagnosis quoted from Linné, Fl. Suec. 7. no. 18. 1745, where the plant is said to occur "in Scania [Sweden] campestri in rudèratis ad urbes & pagos." Specimen from Sweden, from herbarium of Per Larson, seen in Herb. Columbia University.

(?) *Veronica reniformis* Raf. in Med. Repos. New York 5: 360. 1808. "In New Jersey [C. S. Rafinesque in 1803-4]." I am unable to be certain of the identity of this from the short description: "stem procumbent, branched ['branded'], leaves sessile, reniform, hairy, entire, flowers axillar, solitary." It is possibly *V. hederæfolia* L., in which case the petioles must have been so short as to be unnoticed, or *V. arvensis* L., with unusually obscure serration of leaf, or else some introduced species not since reported from America.

Orchards and roadsides, occasional from New York to North Carolina. Introduced from Europe.

(To be continued.)

THE NORTH AMERICAN REPRESENTATIVES OF SCIRPUS
CESPITOSUS.

M. L. FERNALD

THE common sedge, *Scirpus cespitosus* L.¹ which forms conspicuous wiry tussocks and often the dominant turf in the acid tundra and barren regions of the North and in America extends southward to the eastern coast and the mountains of New England, the Adirondacks,

¹ The name was originally published by Linnaeus as *cespitosus* and there is, therefore, no need to alter it, as is often done, to *caespitosus*.